



# Road & Bridge Design Publications

## Monthly Update – March 2021

Revisions for the month of **March** are listed and displayed below and will be included in projects submitted for the **July** letting. E-mail road related questions on these changes to [MDOT-Road-Design-Standards@michigan.gov](mailto:MDOT-Road-Design-Standards@michigan.gov). E-mail bridge related questions to [MDOT-Bridge-Design-Standards@michigan.gov](mailto:MDOT-Bridge-Design-Standards@michigan.gov)

### Special Details

R-102-C: Installation of Woven Wire Fence: Added a note in the note section and text in Detail #1 referencing the proper placement of woven wire fence in the presence of mechanically stabilized earth (MSE) walls.

### Road Design Manual

14.62 & 14.63: Revised addenda submission requirements.

### Bridge Design Guides

Preface: Preface to the Bridge Design Guides is updated. Note that the MDOT Bridge Design Guides are a design and detailing aid. Treat projects individually, confirming design calculations and assumptions are project appropriate, and confirm compliance with appropriate specifications.

### Bridge Design Manual

7.03.12 I. (LFD & LRFD): Added guidance for termination and location of woven wire fence at MSE walls.

Updates to the MDOT Cell Library, Sample Plans, and other automated tools may be required in tandem with some of this month's updates. Until such updates can be made, it is the designer's/detailer's responsibility to manually incorporate any necessary revisions to notes and plan details to reflect these revisions.

# Index to Special Details

3-29-2021

⑥

SPECIAL DETAIL NUMBER	NUMBER OF SHEETS	TITLE	CURRENT DATE
21	2	GUARDRAIL AT INTERSECTIONS	4-9-18
24	8	GUARDRAIL ANCHORED IN BACKSLOPE TYPES 4B, 4T, & 4MGS-8	9-28-18
99	2	CHAIN LINK FENCE WITH WIRE ROPE	9-22-14
R-15-G	3	COVER K	7-26-19
R-27-F	1	BRIDGE APPROACH CURB & GUTTER (USING EXISTING CATCH BASIN)	10-14-19
R-28-J	7	CURB RAMP AND DETECTABLE WARNING DETAILS	5-8-20
R-32-F	8	APPROACH CURB & GUTTER DOWNSPOUTS	10-7-20
R-32-SD	6	APPROACH CURB & GUTTER DOWNSPOUTS (FOR EXISTING RAILINGS)	11-14-19
R-33-G	2	CONCRETE VALLEY GUTTER AND URBAN FREEWAY CURB	8-14-19
R-53-A	22	TEMPORARY CONCRETE BARRIER LIMITED DEFLECTION	8-14-15
R-56-F	6	GUARDRAIL MEDIAN OBJECT PROTECTION	2-5-19
R-60-J	17	GUARDRAIL TYPES A, B, BD, T, TD, MGS-8, & MGS-8D	8-6-20
R-62-H	4	GUARDRAIL APPROACH TERMINAL TYPE 2M	9-22-20
R-63-C	16	GUARDRAIL APPROACH TERMINAL TYPES 3B & 3T	2-5-19
R-66-E	4	GUARDRAIL DEPARTING TERMINAL TYPES B, T, & MGS	9-28-18
R-67-G	16	GUARDRAIL ANCHORAGE, BRIDGE, DETAILS	08-13-20
R-67-SD	7	GUARDRAIL ANCHORAGE, BRIDGE, DETAILS (FOR EXISTING RAILINGS)	11-13-19
R-72-D	6	GUARDRAIL LONG SPAN INSTALLATIONS	3-4-20
R-73-F	3	GUARDRAIL OVER BOX OR SLAB CULVERTS	8-1-19
*R-102-C	1	INSTALLATION OF WOVEN WIRE FENCE (AT STRUCTURES)	3-22-21
R-126-I	5	PLACEMENT OF TEMPORARY CONCRETE & STEEL BARRIER	8-25-15

\* Denotes New or Revised Special Detail to be included in projects for (beginning with) the July letting.

Note:

Former Standard Plans IV-87, IV-89, IV-90, and IV-91 Series, used for building cast-in-place concrete head walls for elliptical and circular pipe culverts, are now being replaced with plans that detail each specific size. The Bureau of Bridges & Structures, Structure Design Section will provide special details for inclusion in construction plans for MDOT jobs. To assure prompt delivery, requests **must be made in advance**. Contact [MDOT-VanIerbergSquad@michigan.gov](mailto:MDOT-VanIerbergSquad@michigan.gov)

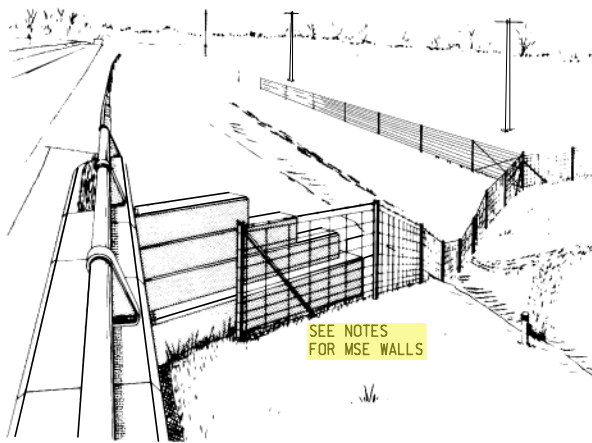
Former Standard Plans IV-93 and IV-94 series have been replaced with precast concrete box & three-sided culverts as per the 2012 Standard Specifications for Construction.

# Index to Bridge Detail Sheets

3-29-2021

7

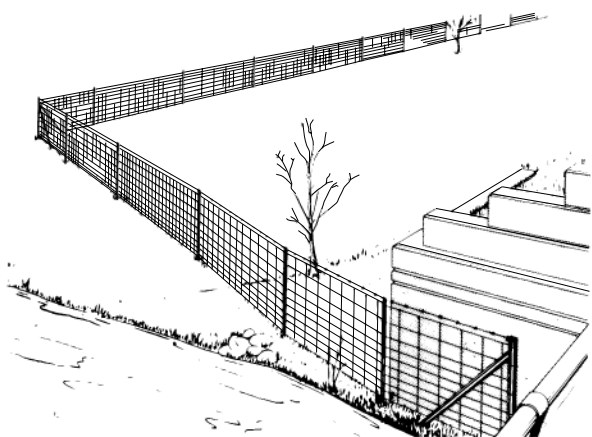
DETAIL NUMBER	NUMBER OF SHEETS	TITLE	CURRENT DATE
B-22-E	5	BRIDGE RAILING, THRIE BEAM RETROFIT (R4 TYPE RAILING)	10-23-19
B-23-F	6	BRIDGE RAILING, THRIE BEAM RETROFIT (OPEN PARAPET RAILING)	10-23-19
B-28-A	7	BRIDGE BARRIER RAILING, TYPE 7	8-24-20
B-29-A	8	BRIDGE BARRIER RAILING, TYPE 6	8-24-20
B-50-A	3	BRIDGE RAILING, CONCRETE BLOCK RETROFIT	10-15-19
B-101-G	2	DRAIN CASTING ASSEMBLY DETAILS	7-26-18
EJ3AC	1 to 3	EXPANSION JOINT DETAILS	10-8-19
EJ4P	1 to 3	EXPANSION JOINT DETAILS	10-8-19
PC-1M	1	PRESTRESSED CONCRETE I-BEAM DETAILS	8-23-17
PC-2H	1	70" PRESTRESSED CONCRETE I-BEAM DETAILS	8-23-17
PC-4F	1	PRESTRESSED CONCRETE 1800 BEAM DETAILS	8-23-17
<p><b>* Denotes New or Revised Special Detail to be included in projects for (beginning with) the July letting.</b></p> <p>Note: Details EJ3AC &amp; EJ4P are interactive, i.e. designers and detailers choose details based upon railing type and angle of crossing. Place all details appropriate for the project, structure specific information, and the Expansion Joint Device quantity on the sheet. The sheet shall then be added to the plans as a normal plan sheet.</p> <p>Detail PC-1M, PC-2H and PC-4F shall have structure specific information and quantities added to the sheet. The sheet shall then be added to the plans as a normal plan sheet.</p>			



NOTE: FENCES TERMINATING AT STRUCTURES WILL HAVE A CLEARANCE OF NO MORE THAN 6". (TYPICAL)

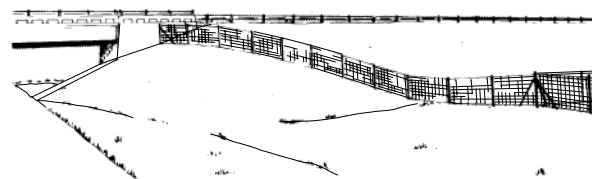
**BRIDGES WITH SLOPE - WALLS**

1



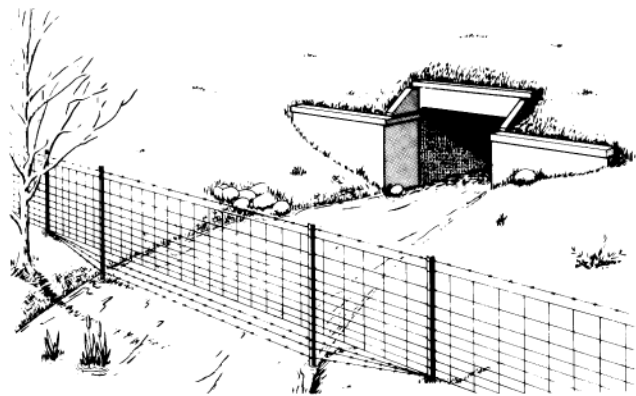
**STREAM CROSSING**

2



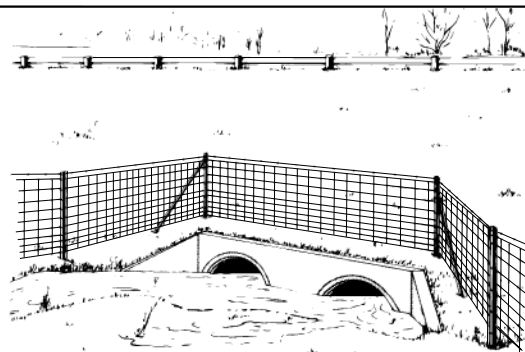
**BRIDGES WITH TURN BACK WINGWALLS**

3



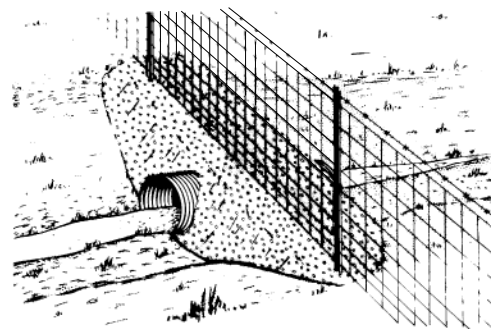
**INSTALLATION AT DITCHES AND DRAINS WITH INTERMITTENT FLOW**

4



**ALTERNATE TO DETAIL 4**

5



NOTE: THIS TREATMENT REQUIRES R.O.W. AND PLAN QUANTITIES FOR ADDITIONAL ITEMS OF WORK INVOLVED.

**ALTERNATE TO DETAIL 4**

6

**NOTES:**

THE INSTALLATION DETAIL APPLICABLE WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR WOVEN WIRE FENCE EXCEPT AS NOTED.

WHEN TWIN BRIDGES DO NOT HAVE A COMMON ABUTMENT WALL ACROSS A MEDIAN AND THERE IS A POSSIBILITY OF LIVESTOCK GAINING ACCESS TO THE FREEWAY THROUGH THE WATERWAY OPENINGS, A FENCE SHOULD BE INSTALLED BETWEEN STRUCTURES ON BOTH SIDES OF THE CHANNEL.

ON LIMITED ACCESS HIGHWAYS WITH SPREAD ROADWAYS OVER CROSS-ROADS, FENCING SHOULD BE PROVIDED BETWEEN THE STRUCTURES ALONG THE CROSS-ROAD, TO CONTROL THE ACCESS BETWEEN THE STRUCTURES.

FOR MECHANICALLY STABILIZED EARTH (MSE) WALLS, TERMINATE THE FENCE AGAINST THE SIDE OF THE WALL OPPOSITE THE STABILIZED EARTH. DO NOT DRIVE POSTS IN MECHANICALLY STABILIZED EARTH.



PREPARED  
BY  
DESIGN DIVISION

DRAWN BY: SCAN

CHECKED BY: W.K.P.

DEPARTMENT DIRECTOR  
Paul C. Ajegba

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF FIELD SERVICES

APPROVED BY: \_\_\_\_\_  
DIRECTOR, BUREAU OF DEVELOPMENT

MICHIGAN DEPARTMENT OF TRANSPORTATION  
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

**INSTALLATION OF  
WOVEN WIRE FENCE  
( AT STRUCTURES )**

F.H.W.A. APPROVAL

3-22-2021  
PLAN DATE

**R-102-C**

SHEET  
1 OF 1

## MICHIGAN DESIGN MANUAL ROAD DESIGN

### 14.62 (revised 3-29-2021)

#### CONTRACTOR INQUIRIES

During the advertising period, Contractors may contact the Department for clarification of plan/proposal material. Each proposal has a Notice to Bidders that specifies all inquiries be made by E-mail through the MDOT e-Proposal system. This is to ensure that all Contractors are given the same information (responses/answers) and, therefore, an equal opportunity to bid the project. An MDOT e-Proposal Resource will post all contractor inquiries within the NTB Inquiry folder in folder 6, (Letting Plans and Proposal). The MDOT PM (Project Manager) will then post the response to the Inquiry within the same document when the correct response is determined.

The MDOT Project Manager/Cost and Scheduling Engineer will evaluate each inquiry and determine if it will have a significant impact on the bids and if an addendum is required. These inquiries may identify errors or oversights in the bidding document. If an addendum is required, the MDOT PM will submit the necessary information to the Specifications and Estimates Unit for review and distribution. The following information is intended to give some direction in dealing with Contractor Inquiries.

If the answer is only a clarification of proposal or plan material that will not give the Contractor an unfair advantage in bidding the project, the MDOT PM can simply provide the answer via the NTB Inquiry e-Proposal System. If possible, to provide clarity and improve effective bid prices, the PM should cite the page or page range for the NTB Response. It is good practice for the PM to utilize their team within their TSC and/or Region to help determine responses and level of detail to any appropriate inquiries.

### 14.62 (continued)

If the answer will give the Contractor an unfair advantage in bidding the project, the item is reviewed with the Supervisor of the Specifications and Estimates Unit to determine if an addendum should be issued.

If an addendum is required, the MDOT PM must take the necessary steps to ensure one is issued.

If it is too late to issue an addendum, the item should be bid as proposed. If the error or omission is significant enough, the project may have to be postponed or withdrawn from letting. See [Section 14.64](#). Although undesirable, an alternate Letting may be necessary if the changes are too great from the original bid submittal.

Although all inquiries are supposed to be made a minimum of one week prior to the letting date (as stated in the proposal), they can still occur during the last week of advertising. Occasionally, these require a late addendum. The decision to **submit** a late addendum **during the week of the letting** should be **discussed with and approved by** the Supervisor of the Specifications and Estimates Unit.

Addenda are sent to prime Contractors only. If a Subcontractor makes an inquiry that results in an addendum, the addendum is sent only to the prime Contractor. MDOT is not responsible for notifying Subcontractors or suppliers.

Contractors may ask for additional information not contained in the plans such as exact locations of miscellaneous quantities on the note sheet or approval to substitute materials. These are examples of information the MDOT PM should **not** provide. Answers should be concise and only clarify, not expand the content of the plan/proposal material. If the question only warrants a yes or no response, briefly state how the inquiry item was or was not determined appropriate for the project in question.

## MICHIGAN DESIGN MANUAL ROAD DESIGN

### 14.63 (revised 3-29-2021)

#### ADDENDA

Changes to the contract (plans, specifications and special provisions) are sometimes necessary when they affect the way a Contractor bids a project. Notification to Contractors is sent out by the Contract Services Division in the form of an addendum (an amendment to the contract documents as advertised). Changes most often originate by Contractor Inquiry. Addenda are issued at the request of the Project Manager/Cost and Scheduling Engineer, after a project is advertised but before the letting. Once the plans and proposal have been sent to the Contract Services Division, for advertising, the plan/proposal package cannot be changed except by addendum.

The Project Manager should determine if changes are necessary by determining the effect on the way the work will be bid. The Project Manager should consult with the Supervisor of the Specifications and Estimates Unit to determine the impacts. If there is no effect on the bidding, an addendum may not be necessary. This type of change can be handled by a plan revision after the project is let, prior to construction.

If an addendum is needed, it is initiated by supplying the required information to the Specifications and Estimates Unit. Detailed instructions and templates for submitting an addendum request can be found in ProjectWise or on the [Plan Development](#) website.

### 14.63 (continued)

Typically there are three types of changes made to the Contract Documents by an addendum. Pay item, proposal, and plan changes require the following information:

#### 1. If Pay Items are Affected:

The proposal line number, pay item number, pay item description, and quantity and units as specified in the Schedule of Items in the Proposal.

#### 2. If the Proposal is Affected:

The proposal page number of the document affected along with the change in the [page\(s\)](#) if not supplying [additional or replacement page\(s\)](#).

#### 3. If Plan Sheets are Affected:

[The sheet number\(s\) of the plan set\(s\) affected along with the change to the plan sheet\(s\) if not supplying additional or replacement plan sheet\(s\).](#)

The FHWA must give prior approval for [applicable](#) addenda involving FHWA oversight projects before they can be published. The Project Manager is responsible for obtaining FHWA approval. E-mail approval from the FHWA Area Engineer is sufficient documentation.

Addenda [issued later than](#) four days prior to letting require the approval of the Specifications and Estimates Supervisor. [The decision to submit a late addendum during the week of the letting should be discussed with and approved by the Supervisor of the Specifications and Estimates Unit.](#)

Project Managers should make every attempt to minimize the number of addenda requests, especially those within the final five days prior to the letting date. Addenda must NOT be used as a process for completing the design of a project after advertisement.

## **PREFACE TO MICHIGAN DEPARTMENT OF TRANSPORTATION BRIDGE DESIGN GUIDES**

These Guides have been developed to serve as an aid for designing and detailing bridges in Michigan. The intent is to provide consistency in office practice and interpretation of **current Specifications.**

It is recognized that **the details within** these Guides are **ever evolving, not** applicable to all situations and that judgment must be used at times.

The Guides contained herein are to be used for reference only. When using details on plans, designers and detailers shall confirm that **design calculations/assumptions,** dimensions and notes are appropriate for job specific situations. **It** is the responsibility of the designer and/or detailer to **ensure** that all details and notes are the most current and **comply with** the appropriate specifications **(AASHTO, AREMA, AWS, ASTM, MDOT, etc.).**



## **MICHIGAN DESIGN MANUAL BRIDGE DESIGN**

### **7.03.12 (continued)**

#### **Mechanically Stabilized Earth (MSE) Wall Requirements**

##### **I. Miscellaneous Requirements**

1. Obstructions, such as footing piles, utilities, catch basins, etc. need to be shown on the plan, elevation, and section drawings for the MSE walls.
2. The limits of the Backfill, Select should extend 1 foot beyond the end of the straps at the bottom of the wall, and slope upward at a 45 degree angle.
3. The Plans should clearly identify the MSE wall horizontal alignment, top of coping elevations, proposed ground line in front of wall, limits of concrete surface coating, texturing notes, design height (H), PVC liner, foundation underdrains, areas where cast-in-place coping is required, moment slab/barrier details, utilities, appurtenances, obstructions to the soil reinforcement and notes from BDM Chapter 8.
4. On return walls, keep the barrier inside of the MSE wall, not on top.
5. The water table must be considered by the geotechnical engineer during his/her investigation. Fluctuations in the water table must be accounted for in the investigation and must also be specified on the Plans (i.e. 100 year flood even should be labeled on the plans).
6. Terminate woven wire fence (Standard Plan R-102-Series) against the side of the wall opposite the stabilized earth, PVC liner and the soil reinforcement. Do not drive fence posts in mechanically stabilized earth. Detail fence termination on plans. (3/29/2021)



## **MICHIGAN DESIGN MANUAL BRIDGE DESIGN - CHAPTER 7: LRFD**

### **7.03.12 (continued)**

#### **Mechanically Stabilized Earth (MSE) Wall Requirements**

##### **I. Miscellaneous Requirements**

1. Obstructions, such as footing piles, utilities, catch basins, etc. need to be shown on the plan, elevation, and section drawings for the MSE walls.
2. The limits of the Backfill, Select should extend 1 foot beyond the end of the straps at the bottom of the wall, and slope upward at a 45 degree angle.
3. The Plans should clearly identify the MSE wall horizontal alignment, top of coping elevations, proposed ground line in front of wall, limits of concrete surface coating, texturing notes, design height (H), PVC liner, foundation underdrains, areas where cast-in-place coping is required, moment slab/barrier details, utilities, appurtenances, obstructions to the soil reinforcement and notes from BDM Chapter 8.
4. On return walls, keep the barrier inside of the MSE wall, not on top.
5. The water table must be considered by the geotechnical engineer during his/her investigation. Fluctuations in the water table must be accounted for in the investigation and must also be specified on the Plans (i.e. 100 year flood even should be labeled on the plans).
6. Terminate woven wire fence (Standard Plan R-102-Series) against the side of the wall opposite the stabilized earth, PVC liner and the soil reinforcement. Do not drive fence posts in mechanically stabilized earth. Detail fence termination on plans. (3/29/2021)